

IS TECHNOLOGY Driving Your Pet INSANE?

Be aware of the secret
flicker and noise that home
technology may transmit to
your pets. **BY BRIAN COOLEY**



Few of us would put up with a TV that emits an annoying whine or a light bulb that flickers, but our pets are another matter.

Their senses are tuned differently than our own and may detect a cacophony of noise and strobe effects that we don't, particularly as we fill our homes with technology. You can fix a beeping smoke detector quickly by changing the battery, but it might also be emitting a constant high-pitched noise that only your dog can perceive. Have we built them an unintended hell?

Dr. Sheila Carrera-Justiz, assistant professor of neurology at the University of Florida College of Veterinary Medicine, says that our pets' sense of hearing makes the world a far different place for them than for you and me. They hear everything we do, plus much more. "I recently got a new dishwasher and it's really quiet — my dogs don't react to it at all," she says. "But [the sound of] the garbage truck going by? That's a different story."

You can't stop the garbage truck from driving up your street, but there are some simple choices you can make that will render your home a less chaotic place for your pet without tossing the electronics that are becoming its backbone.

Ultrasound: The unheard screech

Dr. Katherine Houpt, an environmental factors expert at Cornell University's College of Veterinary Medicine, says pets routinely respond to sound above the frequencies humans can hear, called ultrasound. "Many dogs are afraid of smoke alarms," she says. "So the dog is going crazy and the owner doesn't know why."

Humans nominally hear sound that ranges in frequency from 20Hz, the deepest bass, to 20KHz, the highest-pitched whine you can imagine. In reality, adults may only hear up to maybe half that range, as age reduces our sensitivity to high pitches.

Dogs normally can hear sounds up to 45KHz and cats up to 64KHz. To them ultrasound is just sound, but our gadgets aren't designed with that in mind. Meant to appeal to human buyers, consumer electronics eliminate only the high-pitched noise that we hear. Our household pets are left with the unconsidered residual.

Silencing those sounds

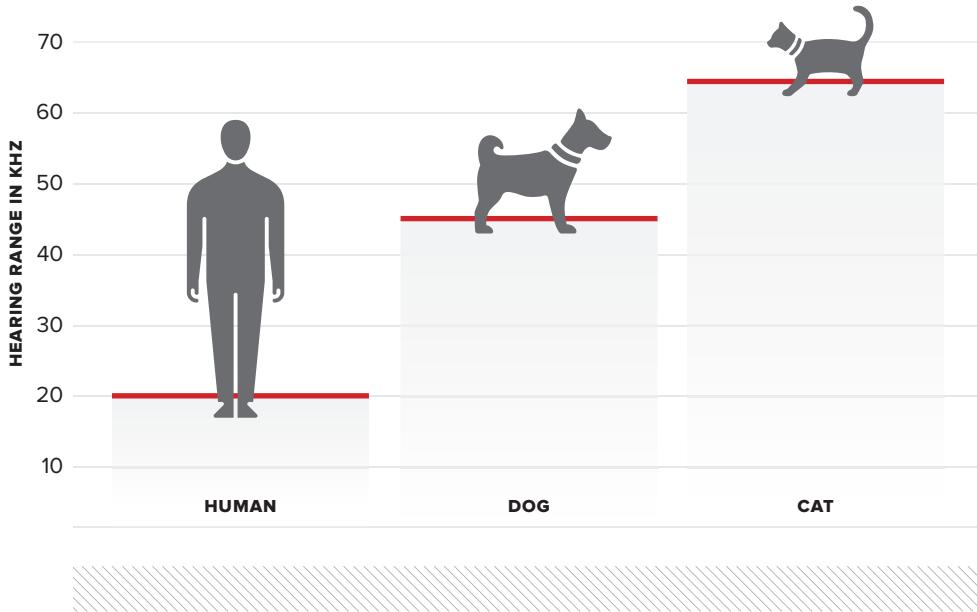
What happens next isn't so clear. While we know that animals hear a vast amount of sound we're deaf to, we don't have as clear a handle on how it may affect them. One possibility comes from Dr. Jeremy G. Turner of the Southern Illinois University School of Medicine Department of

PET-FRIENDLY SMART HOME TIPS

- ▶ **Shut off power to electronics at the plug** (and save on phantom power draw)
- ▶ **Create a quiet room** in the home with no electronics or LED lights
- ▶ **Locate home media equipment in a closet or garage** to isolate ultrasound (and whine and fan noises you can hear as a bonus)
- ▶ **Shop for LED lights with low flicker ratings** on LEDBenchmark.com



WHAT THEY HEAR



Pharmacology. In a 2005 study on the effects of noise on lab animals, he noted that noise can alter the heart, sleep and endocrine cycles in animals and make them more susceptible to seizure.

A 2015 survey by a consortium of veterinary groups in the UK linked seizures in some cats with a phenomenon called feline audiogenic reflex seizures. The study named over a dozen ordinary household sounds that appear to be a cause, including phones ringing, computer printers and even the crinkling of aluminum foil.

Completely ending those sounds in your home would be difficult enough, and it's hard to judge the severity of the problem in your household because there's no rating or labeling of ultrasonic emissions on consumer electronics. There's no easy way to know what exactly your pet hears from the gear in your house. After all, they can't tell us what's bugging them.

Still, there are things you can do. Strategies include turning off components at the plug (which has the added benefit of stopping expensive phantom power draw) or setting up at least one room in your home as a quiet room, free of most or all electronics including LED lights.

"Many dogs are afraid of smoke alarms. So the dog is going crazy and the owner doesn't know why."

DR. KATHERINE HOOPT,
CORNELL UNIVERSITY,
COLLEGE OF VETERINARY
MEDICINE

If you have a dedicated home theater, you can reduce noise for both you and your pet by moving equipment like receivers, amplifiers, DVD players and DVRs (fan noise can be especially irritating). While that's often considered a high-end home theater option, it may not be that difficult using a converted linen closet next to the media room with a couple of in-wall cables to the TV and sound bar.

Flicker: The disco that never stops

It's not just a secret world of household noise, you may also be exposing your pet to a virtual disco ball of flickering lights. LED lighting is taking over the home, with 40 percent of the \$26 billion US LED lighting market going to residences as of 2016, according to Zion Market Research. And LED lights have an inherent problem: They work by flickering on and off, typically too fast for you to see — but that may not be the case for your pets.

David Wren, managing director of PassMark Software in Sydney, blames LED bulb flicker on cheap parts. Because the bulbs are DC devices but run on household AC power, that power needs to be converted before the bulb will light. In most bulbs the part that performs the

conversion does a crude job, with the flicker as a side effect.

In humans the critical flicker fusion (CFF) threshold, or the frequency at which a light appears to be completely steady to the observer, can be as low as 24Hz or 24 "flickers" per second. Most online video is based on 30 frames per second, including everything you watch on CNET. To the human eye, it appears to be fluid, smooth motion.

But as Alexandra Horowitz writes in her book *"Inside of a Dog: What Dogs See, Smell and Know,"* canines have a more sensitive CFF of up to 80Hz or 80 flickers per second. "This might explain why most dogs cannot be planted in front of the television to engage them," she writes. "It doesn't look real."

Going flicker-free

Here again, the exact effects of light flicker on pets are unknown, but research has provided some clues. Dr. Richard Inger at the University of Exeter says that "flickering light can have detrimental effects on a number of other animals, so it's certainly possible that flickering light might have detrimental effect on cats and dogs." And a 2006 study by Southwick's Zoo in Mendon, Massachusetts, and Sacramento City College in California found that a flickering light may cause fear in animals.

Many LED lights' flicker ratings can be found on rating site LEDBenchmark.com. Consider buying lights with lower numbers in both flicker percent and flicker index.

Technology marches on and, unless you're a Luddite, you aren't going to banish it from your home. With smart home tech in particular, we're in the early stages of adoption, creating an opportunity to err on the side of our pets in an area that isn't fully understood. You can have the home theater of your dreams, energy-saving LED lighting and a smoke detector that you can monitor from your phone, but consider your pets in the process. Remember, they live there, too. ●

Brian Cooley (@briancooley) is a CNET editor-at-large. He's helped design animal-friendly technology for facilities of the Marin Humane Society.